
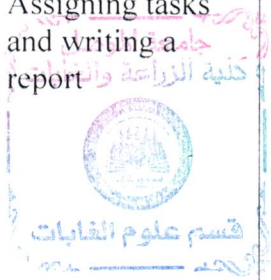


Course Description Form

1. Course Name:	
Watershed Management	
2. Course Code:	
WAMA302	
3. Semester / Year:	
Spring second semester/ 2024-2025	
4. Description Preparation Date:	
1/2/2025	
5. Available Attendance Forms:	
Built-in	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 theoretical hours/3 practical hours(5 hours)/ 3.5 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr.Shaymaa dhayaa ali	
Name:M.M. Mohanad Hamed Yonus	
8. Course Objectives	
Course Objectives <ul style="list-style-type: none"> - Enable the student to understand and comprehend what is related to soil morphology and its relationship to soil science and water resources - Enable the student to know the most important features of the stove - Enable the student to become familiar with the most important factors affecting the development of horizons <ul style="list-style-type: none"> - Empowering the student with the ability to detect diagnostic horizons - The student can explain the development of horizons and address the differences in results for the future over time 	practical: <ul style="list-style-type: none"> - Enabling the student to become familiar with the most important laboratory methods in studying macro- and micro-morphological characteristics and the important chemical and physical analyzes in distinguishing and studying soil horizons. <div style="text-align: center; margin-top: 20px;">  </div>
9. Teaching and Learning Strategies	
Strategy <ul style="list-style-type: none"> - Interactive lecture - Brainstorming - Dialogue and discussion - Assigning tasks and reporting - Presentations of models of soil horizons and their detailed study 	practical: <ul style="list-style-type: none"> - Assigning group work to reveal leadership skills - Assigning tasks and reporting for each experimenter
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2+3	A1Lecture: The student learns about the science of river basin management and its objectives A8Practical: The student learns about the science of river basin management, its foundations and goals, and its relationship with other sciences.	Lecture: Defining the principles of river basin management Practical: A general overview of river basin management, related sciences, and some terminology specific to the science of basin management.	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
2	2+3	A2Lecture: The student learns about the principles and foundations of river basin management D2Practical: The student draws the area of the river basin from maps	Lecture: The concept of hydrology and its branches Practical: Performing area conversions using paper squares and mathematical equations	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
3	2+3	A3Lecture: The student understands the areal characteristics of river basins (topography and elevations) D1Practical: The student draws or establishes the boundaries of the river basin Watershed delicacy	Lecture: The watershed, the topography of the river basins, the surface and subsurface boundaries, and the highs and lows on the contour lines. Practical: Establishing the boundaries of the river from the contour map and how to trace the course of the river from the source to the mouth. The	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report 	Assignments, discussions, Quiz

			highest, lowest, length, and total area of the river basin were determined with the units.		
4	2+3	A4Lecture: It uses the characteristics of the drainage network of water and river beds and their bifurcation A16practical: The student uses the moving average of rainfall	Lecture: River ranks, bifurcation ratio, Horton's number of streams law, and discharge density Practical: Calculating the moving average for five, ten and twenty years	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
5	2+3	A5Lecture: It uses devices to measure the river's flow speed and depth at certain dimensions A10practical : The student explains the calculation of the rainfall rate for the river basin and tests the adequacy of rain measuring stations	Lecture: Mid-section method and current meter Practical: Calculating the rain rate according to the method of Thiessen polygons and calculating the optimal number of rain measuring stations	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
6	2+3	A6Lecture: Iterative analysis of rainstorms is used and the return period is estimated A13practical: The student uses a method to measure the river's flow speed and depth	Lecture: Hazen relationship, estimating the return period of rain, and calculating the return period of rain Practical: mid-section method and current meter	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz

7	2+3	A7Lecture: The student explains Fog drip A15practical: The rain gauge knows its types, how to analyze it, and the fronts	Lecture: Its definition, how and why it occurs Practical: Identifying the types of fronts and rainstorms and their shapes	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
8	2+3	B1Lecture: It employs a test of the efficiency of rain measuring stations with a factor of x A11practical: It is used to calculate the precipitation rate for the river basin	Lecture: Methods of estimating missing information about precipitation and reporting from station records and estimating missing values from records Practical: Calculating the precipitation rate for the river basin using the arithmetic mean and equal precipitation lines	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
9	2+3	C1Lecture: Enhances the hydrological cycle with drawing A17practical : Understands the hydrological cycle	Lecture: Identify some important concepts related to the hydrological cycle, the concept of the hydrological cycle, and the factors affecting flow Practical: rainfall, rain, and evaporation - transpiration	Auditory methods, writing style on the blackboard, direct dialogue method Practical: Assigning tasks and writing a report	Assignments, discussions, Quiz
10	2+3	C2Lecture: It	Lecture: The	Auditory	Assignments,

		<p>establishes the spatial, topographical and morphological characteristics of river basins</p> <p>A18 Practical: Describes the study of the topographic relief of the river basin</p>	<p>area of the river basin, the width of the drainage basin, and the formal characteristics of the basins</p> <p>Practical: Calculating the body factor, calculating the percentage of roundness, elongation, and the compactness factor</p>	<p>methods, writing style on the blackboard, direct dialogue method</p> <p>Practical: Assigning tasks and writing a report</p>	<p>discussions, Quiz</p>
11	2+3	<p>C7 Lecture: Analyzes the effect of land uses on drainage</p> <p>A9 practical : It is used to calculate the amount of erosion of a river basin</p>	<p>Lecture: The effect of the inclination and direction of the basin on drainage, the effect of the height of the basin on drainage, and the effect of deforestation at the expense of urban expansion on runoff.</p> <p>Practical: Finding the amount of calcification of the pelvis and the percentage of calcification of the pelvis</p>	<p>Auditory methods, writing style on the blackboard, direct dialogue method</p> <p>Practical: Assigning tasks and writing a report</p>	<p>Assignments, discussions, Quiz</p>
12	2+3	<p>C4 Lecture: Determines precipitation and its types</p> <p>C8 Practical: The estimate of missing precipitation information at any station is</p>	<p>Lecture: Types and forms of shed</p> <p>Practical: Use the following equation $y=a+bx$</p>	<p>Auditory methods, writing style on the blackboard, direct dialogue method</p> <p>Practical: Assigning tasks and writing a report</p>	<p>Assignments, discussions, Quiz</p>

		enhanced by the straight line equation			
13	2+3	<p>C5Lecture: Calculates the snow measurement and the relationship between precipitation and evapotranspiration</p> <p>A12practical : The student uses the binary mass curve method</p>	<p>Lecture: Measuring the annual rate of rainfall and the relationship between precipitation and evapotranspiration and calculating degrees of drought</p> <p>Practical: Defining and modifying station data</p>	<p>Auditory methods, writing style on the blackboard, direct dialogue method</p> <p>Practical: Assigning tasks and writing a report</p>	Assignments, discussions, Quiz
14	2+3	<p>Lecture: Determines forests and rainfall and calculates the return period</p> <p>A14practical : Knows the fall and its types</p>	<p>Lecture: Estimating the return period of rain, calculating the return period of rain, and the variation of rain retained within one tree</p> <p>Practical: Learn about its effective effect on soil and water and its types</p>	<p>Auditory methods, writing style on the blackboard, direct dialogue method</p> <p>Practical: Assigning tasks and writing a report</p>	Assignments, discussions, Quiz
15	2+3	<p>C7Lecture: Analyzes the effects of forest management on water yield</p> <p>C9practical : Analyzes rain patterns in their various shapes and types related to topography and rainfall</p>	<p>Lecture: Rain patterns of different shapes and types related to topography and rainfall</p> <p>Practical: Ordinary rain gauge, recorded rain gauge, analysis of rain data, different types of rain patterns, regular rainstorm -</p>	<p>Auditory methods, writing style on the blackboard, direct dialogue method</p> <p>Practical: Assigning tasks and writing a report</p>	Assignments, discussions, Quiz

			advanced - medium - late.		
Course Evaluation					
No	Evaluation methods	Evaluation date	Grade	Relative weight	
1	Theoretical final report + practical experience reports	week 15 week 15	7 + 6	13 %	
2	Quiz (1)	Week 3	4 + 2	6 %	
3	Midterm Exam	Week 9	10+ 5	15 %	
4	Quiz (2)	Week 12	4 + 2	6 %	
5	Final practical Exam	Exam week	20	20 %	
6	Final Exam	Final Exam week	40	40 %	
	Total		100	100 %	
Learning and Teaching Resources					
Required textbooks (curricular books, if any)		River basin management			
Main references (sources)		Researches			
Recommended books and references (scientific journals, reports...)		Papers			
Electronic References, Websites					

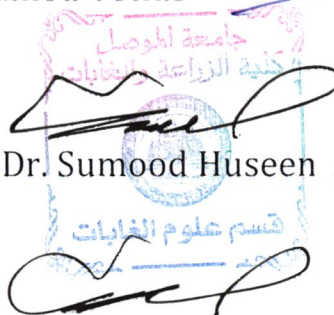
Teacher of Theory : Dr.Shaymaa dhayaa ali



Teacher of Practical : M.M. Mohanad Hamed Yonus



Chairman of the Scientific Committee : Dr. Sumood Huseen Ali



Head of the Dept. of Forestry Sciences: Dr. Sumood Huseen Ali